2. Philosophy

At the Laboratory for Atmospheres, we are committed to:

" carrying out high quality research;
" balancing a scientist's research and programmatic responsibilities;
" enhancing interactions with the academic community, other NASA centers and federal laboratories, and the international community;
" supporting Project Scientists who represent the scientific interests of the outside community in NASA's mission; and
" reaching out to the general public, thereby nurturing public interest in atmospheric science.

Research Quality

The Laboratory places high importance on promoting and measuring quality in its scientific research. We strive to assure high quality through peer-review funding processes that support approximately 90% of the work in the Laboratory. The overall quality of our scientific efforts is evaluated periodically by three standing committees and by ad hoc committees of advisors from the external scientific community, as detailed in Appendix 2 of this document.

Programmatic and Research Balance

Unlike most universities, our Laboratory often has relatively large programs, sizable satellite missions, or observational campaigns that require the cooperative and collaborative efforts of many scientists. We aim to ensure an appropriate balance between our scientists' responsibility for these large collaborative projects and their need for an active individual research agenda. This balance allows members of the Laboratory to continuously improve their scientific credentials.

Interactions with Other Scientific Groups

Interactions with the Academic Community

The Laboratory depends on collaboration with university scientists to achieve its goals. Such relationships make optimum use of government facilities and capabilities and those of academic institutions. These relationships also promote the education of new generations of scientists and engineers. Educational programs include summer programs for faculty and students, fellowships for graduate research, and associateships for postdoctoral studies. The Laboratory frequently supports workshops on a wide range of scientific topics of interest to the academic community, as shown in Appendix 5.
NASA and non-NASA scientists work together on NASA missions, experiments, and instrument and system development. Similarly, several Laboratory scientists work on programs residing at universities or other Federal agencies.

The Laboratory routinely makes its facilities, large data sets, and software available to the outside community. The list of refereed publications, presented in Appendix 7, reflects our many scientific interactions with the outside community; 70% of the publications involve co-authors from institutions outside the Laboratory.

Prime examples of collaboration between the academic community and the Laboratory include these recently established cooperative agreements with universities:

* Earth System Science Interdisciplinary Center (ESSIC), with the University of Maryland, College Park;
* Joint Center for Earth Systems Technology (JCET), with the University of Maryland, Baltimore County;
* Joint Center for Geoscience (JCG), with the Massachusetts Institute of Technology;
* Joint Center for Observation System Science (JCOSS), with the Scripps Institution of Oceanography, University of California;
* Center for Earth-Atmosphere Studies (CEAS), with Colorado State University;
* Cooperative Center for Atmospheric Science and Technology (CCAST), with the University of Arizona; and
* Cooperative Institute for Atmospheric Research (CIFAR) with UCLA.

These joint centers have been organized to increase scientific interactions between the Earth Science Directorate at GSFC and the faculty and students at the participating universities.

University and other outside scientists visit the Laboratory for periods ranging from one day to as long as two years. (See Appendix 1 for list of recent visitors and Appendix 4 for seminars.) Some of these appointments are supported by Resident Research Associateships offered by the National Research Council (NRC) of the National Academy of Sciences; others, by the Visiting Scientists and Visiting Fellows Programs currently managed by the Universities Space Research Association (USRA). Visiting Scientists are appointed for up to two years and carry out research in pre-established areas. Visiting Fellows are appointed for up to one year and are free to carry out research projects of their own design. (See Appendix 3 for a list of NRC Research Associates, USRA Visiting Scientists, Visiting Fellows, and Associates of the Joint Institutes during 1998.)

Interactions with Other NASA Centers and Federal Laboratories

The Laboratory maintains strong, productive interactions with other NASA centers and federal laboratories.

Our ties with the other NASA centers broaden our knowledge base. They allow us to complement each other's strengths, thus increasing our competitiveness while minimizing duplication of effort. They also increase our ability to reach the agency's scientific objectives.

Our interactions with other Federal laboratories enhance the value of research funded by NASA. These interactions are particularly strong in ozone and radiation research, data assimilation studies, water vapor and aerosol measurements, ground truth activities for satellite missions, and operational satellites.

Interactions with Foreign Agencies

The Laboratory has had several ongoing programs in cooperation with non-U.S. space agencies. These programs involve many of the Laboratory scientists.

Major efforts include the Huygens Probe Gas Chromatograph Mass Spectrometer (GCMS), with the European Space Agency (CNES); the Total Ozone Mapping Spectrometer (TOMS) Program, with the Japanese National Space Development Agency (NASDA) and the Russian Scientific Research Institute of Electromechanics (NIIEM); the Neutral Mass Spectrometer (NMS) instrument, with the Japanese Institute of Space and Aeronautical Science (ISAS); and climate research with National Climate Center, Beijing, People's Republic of China.

Laboratory scientists interact with about twenty foreign agencies, about an equal number of foreign universities, and two foreign companies. The collaborations vary from extended visits for joint missions to brief visits for giving seminars or, perhaps, working on papers.

Support for Project Scientists

Space flight missions at NASA depend on cooperation between two upper-level managers, the project scientist and the project manager, who are the principal leaders of the project.

The project scientist must provide continuous scientific guidance to the project manager while simultaneously leading a science team and acting as the interface between the project and the scientific community at large. Taking on the responsibilities of a project scientist provides a unique opportunity for Laboratory staff to obtain significant scientific management experience. Typically, the Laboratory invites candidates from the senior ranks to fill these roles.

Table I lists project and deputy project scientists for current missions.

Table I: Laboratory for Atmospheres Project and Deputy Project Scientists

PROJECT SCIENTISTS	**DEPUTY PROJECT SCIENTISTS**
Name Project	**Name Project**
Robert Adler AGS	Anne R. Douglass UARS, EOS/ CHEM
Robert Atlas Zephyr	Ernest Hilsenrath EOS/CHEM
Mark Schoeberl EOS/CHEM	Arthur Hou TRMM
Pawan K. Bhartia TOMS	
Dennis Chesters GOES	
Jay Herman Triana	
Yoram Kaufman EOS AM	
Christian Kummerow TRMM	
Charles Jackman UARS	
Joel Susskind POES	
Warren J. Wiscombe GSFC/ DAAC	
EOS VALIDATION SCIENTIST	**AIRCRAFT CAMPAIGN CO-PROJECT/ Mission Scientists**
Name Project	**Name Project**
David O'C. Starr EOS	Yoram Kaufman TARFOX
	Randy Kawa AEAP
	Paul A. Newman POLARIS
	David O'C. Starr SUCCESS
	Anne Thompson SONEX
	Si-Chee Tsay TARFOX

	Gerald Heymsfield TEFLUN

Outreach and Education

Members of the Laboratory interact with the general public to support a wide range of interests in the atmospheric sciences.

Among other activities, the Laboratory raises the public's awareness of atmospheric science by presenting public lectures and demonstrations, by making scientific data available to wide audiences, by teaching, and by mentoring students and teachers.

Section 8 presents details of the Laboratory's outreach activities during 1998.

Responsible NASA official: Bob Theis